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~~1999/8004 - 1263~~

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WHAT IS CLAIMED IS:

~~Patent claims~~

- 5 1. An apparatus for carrying out optical measurements comprising
- 10 a) one or more, preferably two, light sources with the same or different, preferably different, spectral regions,
- 15 b) one or more beam guidance systems for detecting and guiding the light to the desired measurement location,
- 20 c) one or more filter(s) for targeted separation or combination of the desired spectral regions and for beam shaping,
- d) one or more diaphragm(s) for limiting the beam diameters and beam shaping,
- e) suitable sensors for detecting the signal generated by the material to be measured and reference signals.
- 25 2. The apparatus as claimed in claim 1, having a light source comprising a source which emits in the UV-Vis spectral region, preferably in the range between 320 and 750 nm.
- 30 3. The apparatus as claimed in claim 1, having a light source which is a xenon pulsed light source.
4. The apparatus as claimed in claim 1, having a light source which emits in the red or infrared (NIR) spectral region, preferably between 600 and 900 nm.
- 35 5. The apparatus as claimed in claim 1, having a light source which is a laser diode or light-emitting diode (LED).

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6. The apparatus as claimed in claim 5, where the IR-LED emits in the range between 800 and 950 nm.

5 7. The apparatus as claimed in ^{claim 1} ~~claims 1 to 6~~, where the light source is used in pulsed operation.

8. The apparatus as claimed in claim 1, provided with a beam guidance arrangement which is constructed from discrete individual components on a fixed connection axis.

9. The apparatus as claimed in claim 1, provided with a beam guidance arrangement which comprises flexible optical fibers.

10. The apparatus as claimed in claim 1, provided with an insert for accommodating filters which are used for calibration of ^B the light sources used with regard to said sources' wavelengths or absorption.

11. The apparatus as claimed in claim 1, provided with diaphragms for limiting the available beam range.

12. The apparatus as claimed in claim 1, comprising a partly transparent mirror for detecting a defined proportion of the useful light as reference.

13. The apparatus as claimed in claim 1, provided with a diaphragm for masking out the light impinging at small angles around the axis of incidence.

14. The apparatus as claimed in ^{claim 1} ~~claims 1 and 13~~, in which the diaphragm is used on the one hand for masking out the scattered light impinging at small angles around the forward direction, and also for transmitting the light impinging at small angles around 0°, for further measurement.

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- claim 1*
15. The apparatus as claimed in ~~claims 1, 13 and 14~~ in which the light is detected at angles of $\pm 5^\circ$ around the forward direction.
- claim 1*
16. The apparatus as claimed in ~~claims 1, 14 and 15~~, such that the impinging light is guided out from the beam path with the aid of a beam deflection arrangement.
17. The apparatus as claimed in claim 16, such that the beam deflection arrangement comprises rigid optical components or optical waveguides with corresponding connection components.
- claim 1*
18. The apparatus as claimed in ~~claims 1 and 15 to 17~~, such that the detected light is directed to the entrance slit of a spectrophotometer unit.
- claim 1*
19. The apparatus as claimed in ~~claims 1, 13, 14~~, in which the scattered light passing through the diaphragm is imaged onto the input of a detector by a lens system.
- claim 1*
20. The apparatus as claimed in ~~claims 1, 13, 14 and 19~~, provided with filters for separating out and suppressing light of undesirable wavelength ranges.
21. The apparatus as claimed in claim 1, provided with optoelectronic components for the pulsed driving of the light sources used.
22. The apparatus as claimed in claim 1, provided with electronic components for amplification and conversion of the signals for further measurement processing.
23. The apparatus as claimed in claim 1, comprising a processor unit for common control of the

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components, evaluation and presentation of the signals.

5 24. The apparatus as claimed in claim 1, comprising a dichroic filter which combines the wavelengths available from the ^Blight sources of different spectral bandwidth for the excitation of the material to be measured in a cuvette onto a common beam guidance arrangement.

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25. The use of an apparatus as claimed in at least one of ^{claim 1}~~claims 1 to 2~~ in a spectrophotometric and/or nephelometric analyzer in in-vitro diagnosis.

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